

# SCIENCE & GOVERNMENT REPORT

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November 1, 1975

## Genetic Research Moratorium Runs into Trouble

When an influential group of geneticists recommended last February that some potentially hazardous experiments should be deferred, pending development of safer experimental systems, it was widely anticipated that the moratorium would be short lived and bearable, even for those researchers who were eager to get on with their work. According to expectation confidently voiced at the meeting, which was held at Asilomar, California, safe systems would probably be available in a matter of weeks, and virtually all planned research could swiftly be resumed (SGR Vol. V, No. 6).

It has since become obvious, however, that such expectations were unduly optimistic. Instead of taking a few weeks to develop and test safer experimental systems, those who have been trying to produce such systems for the past 8 months say they may still need another year. Consequently, it may prove difficult to ensure that the moratorium will be maintained.

An NIH advisory committee, which has been trying to incorporate the Asilomar guidelines into regulations governing federal support of genetic research, has run into considerable trouble. The committee drafted a set of regulations at a meeting in Woods Hole in July, but when the draft was circulated for comments, it was widely criticized for watering down the Asilomar guidelines and it has since been scrapped. A committee meeting scheduled for October was then cancelled to allow a new set of guidelines to be drafted in time for another meeting in December.

Typical of the criticisms leveled at the draft regulations was a petition, signed by 48 scientists who attended a meeting at Cold Spring Harbor in August, which was sent to Dewitt Stetten, Deputy Director of NIH and chairman of the advisory committee. The petition said that "we are concerned that the present draft appears to lower substantially the safety standards set and accepted by the scientific community as represented at the meeting in Asilomar." As a result, Betty Kutter, of Evergreen State College, Olympia, Washington, a member of the committee and a vocal critic of the earlier draft, has been charged with the task of rewriting the regulations.

The experiments in question involve use of a newly discovered technique for snipping genes from the DNA of various organisms and higher animals, and transplanting them into another micro-organism, such

as a virus or bacterium, so that they will be copied every time the virus or bacterium reproduces. Though the technique holds considerable promise for molecular biology, the worry is that it may produce genetically modified micro-organisms with unpredictable biological properties, which could pose a health hazard if they escape from the laboratory environment.

Because ordinary laboratory safety systems are not completely reliable — an estimated 5000 people have

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## In Brief

The National Cancer Institute finds itself perched atop a keg of TNT on the perplexing question of whether the highly touted program of X-ray examination for breast cancer is doing more harm than good. While several NCI task forces study the problem, John C. Bailar III, a biostatistician and editor of the *NCI Journal*, has written a paper that concludes that "the possible benefits of mammography have received more emphasis in the clinical literature than have its defects. Promotion of mammography as a general public health measure is premature."

The latest scorecard on federal funds for higher education puts the University of Washington at the top of the list, with \$81.8 million last year. Washington replaces MIT, which drops to sixth since its Draper Lab was reclassified as an independent nonprofit institute. Others in the top ten are UCLA, Wisconsin, Harvard, UC San Diego, Minnesota, Howard, Stanford and University of Michigan.

The latest twist in the flouridation saga is that Rep. James J. Delaney (D-NY), author of the zero-tolerance rule on carcinogenic food additives, wants a moratorium on flouridation of water, pending proof that flouridation is not linked to cancer. A contention that it has been circulated by Dean Burk, retired director of cytochemistry at NCI, who says his studies established that flouridation is responsible for at least 25,000 cancer deaths annually in the US.

*Dept. of Questionable Problems:* An article in the October Journal of Medical Education notes that the dropout rate from medical schools has declined to 1.5 per cent, and proposes a study to reduce the figure further.

## Moratorium: Draft Safety Guidelines in Dispute

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been infected as a result of laboratory studies on hazardous micro-organisms in the past 30 years — the Asilomar conference recommended that gene transplant experiments which could pose high risks should not be attempted until safer systems are developed. Specifically, the conference suggested that such experiments should be conducted only with micro-organisms which contain genetic mutations rendering them incapable of surviving outside the laboratory environment.

Though such disabled micro-organisms had not then been produced, their construction was not expected to pose much of a problem. But one researcher who has been trying to construct a modified bacterium has found that many of the genetic mutations he has tried to build into the organism either revert back to normal or are by-passed. It was anticipated, for example, that one simple mutation would prevent the bacterium from synthesising a cell wall, unless it is artificially provided with a chemical. But instead of one mutation, it will require at least five to produce such a result, he told SGR.

Moreover, once a suitably disabled micro-organism has been produced, it will require extensive testing in animals to ensure that it is, indeed, incapable of surviving outside the laboratory. That could take as much as six months.

The NIH advisory committee was therefore faced with the problem that the safety systems recommended by the Asilomar conference are not yet available, but there is considerable pressure for experiments to be resumed. Its draft guidelines therefore attempted to steer a middle course by stipulating that although some types of experiments should await the production of disabled micro-organisms which have been rigorously tested, others could proceed with disabled organisms which have not been subjected to such rigorous testing.

Stetten told SGR that most of the critics of the draft regulations argued for more stringent safety precautions, and he said that in general he agrees with that approach. He also noted, however, that he has received a few comments from scientists arguing that the draft was too restrictive because, by insisting that some experiments should still be deferred, it infringed their academic freedom.

It therefore seems likely that the final version of the guidelines — if one can, indeed, be hammered out at the December meeting — will be considerably more restrictive and it could prolong the moratorium for a number of studies.

Ironically, the expectation that genetically disabled micro-organisms could be produced within a very short time was one of the chief factors which led to almost unanimous agreement at Asilomar. If it had then been realized that such micro-organisms could take more than 18 months to construct and test, the meeting could well have ended up disastrously split between researchers arguing for restraint and others anxious to press ahead.—CN

### Academy Lists Forum Series

The National Academy of Sciences has announced the schedule for the continuation of the Academy Forum series that it started in 1973 to help de-mystify science for the public.

Conducted in a town-hall format with blue-ribbon panels setting out themes and arguments on subjects of topical interest, the forums have generally been dominated by wind-baggery from the floor. But they serve as evidence that the Academy is trying to shake its creaky image and they also do contain a fair amount of explication of complex issues. The forums are held from 9 a.m. to 1 p.m. and are open to the public without charge.

The latest series, fashionably though inexplicably described as "in a bicentennial context," will commence November 11 with a session on "Scientific Theories and Social Values," chaired by Robert McC. Adams, of the Oriental Institute, and Philip Morrison, of MIT.

This will be followed by "The Citizen and the Expert," January 20, chaired by Daniel E. Koshland Jr., University of California, Berkeley, and Frederick C. Robbins, Case Western Reserve University.

Also scheduled, but with details yet to be announced, are "Frontier Expansion or Inward Development," March, and "Rude Colony to Dominant Power," May.

Previously held forums dealt with the safety of drug and food additives, energy alternatives, biomedical human experimentation, and artificial sweeteners. Proceedings of each of these have been published and are available from the Academy Forum, National Academy of Sciences, 2101 Constitution Ave., Nw., Washington, DC 20418. Prices vary, but are in the neighborhood of \$5.50 each.

## NSF's Curriculum Program Gets Mixed Reviews

The National Science Foundation's controversial efforts to support the development of innovative school science curricula have received a mixed assessment from two independent studies. Both investigations have pinpointed some potentially embarrassing administrative deficiencies in NSF, and as a result some changes can be anticipated.

The assessments, made public last month by Rep. Olin Teague (D-Tex), chairman of the House Committee on Science and Technology, were both conducted in response to growing criticism of an NSF-sponsored curriculum called MACOS (Man: A Course of Study), a social science course which, among other things, graphically depicts the rough realities of Eskimo life (SGR Vol. V, No. 7). When criticisms of MACOS became shrill last March, Teague asked the General Accounting Office to look into the program; two months later, he appointed another independent committee, chaired by James Moudy, Chancellor of Texas Christian University, to conduct an overall assessment of NSF's school science programs.

A majority of the members of the Moudy committee came to the conclusion that, although some changes should be made in NSF's policies, the Foundation should continue to support the development of school science curricula. The committee notes, in fact, that NSF has been supporting such activities since the late 1950s, and that the first course it sponsored — a physics curriculum — "was so successful as to start a revolution in science education." Problems have arisen, however, with social science courses, and with NSF's support of programs to ensure that the courses it helps to develop are actually used in the schools.

The committee's report states that "we were disappointed to find numerous examples of disjunction of NSF policy and practice, incompleteness of policy statements, belated attention to policy development, and an impression that policy formulation and updating have not been a strong point of the National Science Board and the NSF staff." The committee suggests, in particular, that it "gained the clear impression, though without complete examination of

the evidence, that staff monitoring of projects is inadequate."

"We found little evidence of active and continuing project evaluation by staff, and we noted apparent severe deficiencies of objective evaluations by outsiders," the report continues. The only evaluation so far conducted of the MACOS project, for example, "was commissioned by the developers and cannot be viewed as an outside evaluation," the report notes.

As for the question of whether or not NSF should provide support to implement courses which it helps to develop, the committee decided that it is "not unreasonable to expect that a new and promising curriculum that has survived the pilot-testing program should need and deserve some assistance in bringing it fairly quickly to the attention of large numbers of teachers." But it also noted that "neither is it unreasonable to expect that it should soon be able to make its own way if it is truly a good curriculum."

A majority of the committee therefore recommended that NSF should continue to help implement the courses which it supports, but that such activities should be relatively modest and short lived. That recommendation is in sharp contradiction to Congress's decision to remove all funds from NSF's FY 1976 budget for curriculum implementation.

NSF's support of activities designed to promote the MACOS course, in particular, have become a major target for NSF's critics. The committee points out, however, that because of factors such as the price of the MACOS course material, which was "above the going market," and a requirement that teachers for MACOS should undertake a special training course, no publisher was originally interested in marketing the material. NSF was consequently faced with the fact that it had spent several million dollars in developing a course which might not have been taken up commercially.

A few publishers eventually demonstrated an interest in MACOS, however, and the committee notes that

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## GAO Charges Oceanography Programs Are a Mess

In what is fast becoming an annual lament, the Congressional General Accounting Office (GAO) has produced a report sharply critical of the lack of coordination among government agencies involved in marine programs.

The study, conducted for the Senate Commerce Committee, begins by noting that, in spite of numerous recommendations dating back to the 1950s that marine programs be more closely coordinated, "the United States has no comprehensive national ocean program." Marine science and other oceanic activities are now spread over 21 different units in the federal government, GAO reports, and it suggests that "marine science activities are as scattered today as they were in 1966," when Congress passed the Marine Resources and Engineering Development Act in an attempt to establish a coherent oceanography program.

In fact, the report even comes close to suggesting that the situation has deteriorated over the past 10 years, because overlap among federal agencies now seems to be rampant. Of 4020 different research projects underway in 1973, GAO estimates that 2685 involved "up to 10 departments and agencies in 5 areas of research."

Though the report acknowledges that "it is generally difficult to convincingly demonstrate duplicative

research efforts," it describes in some detail how seven departments and agencies are supporting similar studies on the structure and composition of the ocean floor, six departments and agencies are looking at the biology of marine organisms, five are developing, testing and evaluating oceanographic instruments, and five others are conducting "at least nine programs which study the effects of pollutants on marine ecosystems." From those examples, GAO concludes that "it is doubtful" that the resources of all those agencies "are being applied to best serve national purposes."

GAO, of course, isn't the only body which has attempted to achieve greater coordination in oceanographic programs. Since 1966, GAO notes, several permanent and semi-permanent panels, committees and commissions have been established to bring some order out of the apparent chaos, but their calls for reorganization have largely gone unheeded. And even the creation of the National Oceanographic and Atmospheric Administration in 1970 hasn't helped, the GAO report laments, because NOAA "was not authorized to direct the marine activities of other federal departments or agencies."

GAO's prescription for reform is for the federal government to undertake yet another study of the national objectives, needs and resources in ocean affairs, develop a national ocean program and plan, and then reorganize the federal bureaucracy to administer such a program.

A subcommittee of the Senate Commerce Committee, under the chairmanship of Sen. Ernest Hollings (D-S.C.), is now attempting to formulate such a program, but in view of the lack of enthusiasm for previous calls for reform, wholesale changes shouldn't be anticipated.

(Need for a National Ocean Program and Plan — G.G.D.-75-97, \$1, GAO, Washington, DC 20548).

*(Continued from Page 3)*

when the final publisher was chosen "it was apparently given a contract under terms more favorable than had been discussed with other publishers." The implementation program, which involved "a new marketing concept...in the place of the usual 'book salesman,'" may also have brought "undue influence upon local decisions to adopt MACOS," the committee notes. It therefore recommends that implementation support for MACOS be terminated, which Congress has already done.

The GAO report also criticized NSF's curriculum development policies, suggesting in particular that the Foundation should tighten the review process for new curricula, and that it should pay more attention to evaluating the effectiveness of courses which it helps to develop.

(The GAO report, "Administration of the Science Education Project 'Man: A Course of Study' (MACOS)" No. MWD-76-26, is available for \$1 from GAO, Washington DC 20546. The Moudy Report is available from the House Committee on Science and Technology, Washington DC 20515.)—CN

### Symposium on Technological Trade

An all-day symposium on East-West Technological Trade will be held in Washington by the Department of Commerce on November 19.

Among the topics to be covered are: Technology Trade with Centrally Planned Economies, Problems Associated with Technology Transfer, and Dealing with the People's Republic of China — Case Histories. The registration fee is \$30. For additional information, contact William Holt or Margaret Michel, Room 3877, Department of Commerce, Washington, DC 20230; (202) 967-2394.



## Contract Issued for Review of Federal R&D Programs

Like much else in the Nixon Administration, the 1972 President's Message on Science and Technology was loudly announced and then quietly laid to rest. But every now and then, there's a sprout from the grave, the latest of which is an announcement of a federal contract for research on how to get more out of research.

The contract, for \$275,000 over 18 months, has been awarded to the Stanford Research Institute (SRI) by the National Bureau of Standard's Experimental Technology Incentives Program (ETIP), which was established in response to Nixon's call for efforts to stimulate civilian technology. Following a startup which was slow even by the leisurely standards of the venerable Bureau, ETIP has been touting itself as a pioneering winner. But the realities of the matter remain obscure, as witness a recent ETIP profile in *Science* under the headline, "Technology Incentives Program: Success or Phony

Hard Sell?" The reader is left to his own conclusions.

According to an announcement from SRI, it will "review the R&D planning procedures of 15 (non-defense) federal agencies" for two purposes:

"One is to help it describe, categorize and compare past practices of federal agencies that support civilian R&D with present practices in order to understand how such R&D is guided toward its stated objectives. The other purpose is to help ETIP understand the political, economic and organizational contexts in which such R&D functions in order to offer federal decision makers practical guidelines for planning, project selection, resource allocation, project management and evaluation of these programs."

The SRI project is headed by Howard Cook, whose title is "senior decision analyst," with the assistance of Egils Milbergs and William A. Porter.

## A Guide to "Alternative" Journals on Science Policy

Over the past decade, political and social turbulence here and abroad has been accompanied by a boom in the founding of publications by scientists, engineers, and physicians concerned with the public policy implications of their work.

Virtually all of these publications are shoestring operations that tend to the left side of the political spectrum. Many of them are more sporadic than periodical, and often dish up shrillness and new left jargon in heaping portions. But as rich a source of alternative reporting and thinking and as a counterweight to the ponderosity and timidity of many establishment journals, they often provide rewarding reading.

Now, thanks to a list compiled by the Tallahassee chapter of Scientists and Engineers for Social and Political Action, we have an inventory of many such publications, under the title of, "Periodicals that Progressive Scientists Should Know About." Included are a few, such as *New Scientist*, UNESCO's *Impact of Science on Society*, and others, that are well-established solid citizens in the publishing field. But, by and large, the list is composed of journals that rarely make the reading room of your neighborhood public library.

SGR cannot vouch for the accuracy of the list, nor did it arrive with information about subscription fees. But it looks reliable, and our guess is that requests for sample copies or subscriptions will receive a response.

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## Readings: From "Idiot News" to "Rain" and "Sanity"

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### SANITY

Campaign for Nuclear Disarmament  
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St. Louis, Missouri 63130

## Weizmann Head Invites Research Ties with Arabs

In the long warming process that occurred in US relations with the Soviet Union and later with the People's Republic of China, the diplomats relied upon sports and science to initiate progress from armed truce to civility. Is something of this sort eventually going to happen between Israel and her Arab neighbors?

SGR claims no knowledge of the sporting scene, and sees no concrete sign of a Middle East scientific love fest getting underway. But it should be noted that American officials, mindful of the East-West experience in scientific relations, have privately been talking up the benefits that they foresee from Israeli-Arab scientific and technical cooperation. And though the Israelis and the Arabs ritualistically adhere to aloofness from each other in international organizations and elsewhere a senior Israeli research administrator is now publicly on record with an explicit offer of scientific relations with the Arab nations.

Speaking in New York on October 12, Michael Sela, newly elected president of the Weizmann Institute of Science, told a dinner meeting observance of the Institute's 30th anniversary:

"I think I can safely promise you, in the name of all the Institute's scientists, that if we are ever asked to do so, if the time indeed comes when any of our neighbors turn to us for guidance or assistance in any shape or form, the intellectual capabilities, special skills and experience, and trained personnel which have served to make the Institute so potent a force, not only within Israel but also within the world scientific community, will unquestionably be made available to them."

There is no report of any Arab response to this offer, which is not surprising, considering the raw state of relations that still prevails between Israel and her neighbors.

But apart from that, if the Israelis are really interested in establishing scientific and technical linkages with the Arabs — and they apparently are — it would be useful for them to climb off their scientific high horse and think in terms of cooperation, rather than "guidance or assistance."

Israel is, indeed, a scientific powerhouse relative to the present state of its neighbors, but however deficient the Arabs may be in glistening laboratories of the Weizmann variety, they are not likely to come to their old foe for help, though eventually they may come for collaboration on common problems.

The state of scientific research in the Arab lands has long been a source of despair for Arab scientists, who have been unable to acquire any decent amount of

financial support from their governments. Many of the most talented eventually go abroad, where they do amply well to dispose of the old racist notion that Arabs and science do not mix.

With civil war leveling Beirut, the well-regarded medical and scientific research facilities of the American University of Beirut face a doubtful future. Egypt has regularly paid lip service to the importance of building up its research base, but inflation, uncontrolled population growth and a war economy have always sidetracked its ambitious plans. And though several of the oil-rich Arab lands are pouring large amounts into American-assisted plans for higher education and research, it will probably be a long time before they join the mainstream of modern science.

In this circumstance, opportunity, need, and the generally good fellowship of scientists provide favorable conditions for some cautious steps toward Arab-Israeli cooperation, possibly, at first, under the umbrella of some broader international collaboration. Common interests, such as solar energy and arid land research, could provide a natural excuse for working together.

The odds for this happening soon are probably quite remote. But it is worth noting that among the many scientific exchange programs that Israel has cultivated with other nations, one of the largest and most successful is with West Germany.—DSG

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## Larger Role Sought for Human Research Panel

Senator Kennedy has introduced a bill (S 2515) to provide permanency and a government-wide jurisdiction for the temporary federal commission that was created last year to develop guidelines for human experimentation. With the subject rapidly sinking into a legal and moral quagmire, the biomedical research community has a lot at stake in the operations of the commission and the proposal for a continuing and broader organization.

As things now stand, the existing National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research has a jurisdiction limited to research supported by the Department of Health, Education, and Welfare; moreover, the Commission's charter is due to expire in 13 months.

Created by the National Research Act of 1974, the Commission was directed to concentrate its initial efforts on the emotional issue of fetal research. Its efforts resulted in the publication last May of a Report and Recommendations on Research on the Fetus, which HEW later incorporated into a series of regulations that now govern its support of research in this field. The regulations have had the two-sided effect of prohibiting certain procedures while providing legal protection for many others; their appearance also

ended a virtual moratorium that went into effect pending HEW's final pronouncement on the subject. Considering the political volatility of fetal research, the result was probably the best that could be obtained from the perspective of carrying on with a good deal of research in this field.

Following completion of that task, the Commission has been devoting the remainder of its two-year charter to developing recommendations concerning experimentation on children, the mentally incompetent, and prisoner populations.

Kennedy's new bill was introduced after recent revelations about experiments on humans performed by the Department of Defense and the Central Intelligence Agency. As provided for in the bill, the present National Commission would be elevated to a Presidential Commission, thus giving it authority to write the rules for all federal agencies whose funds support research on human subjects. The present membership, which is composed of scientists and physicians, would be expanded to include four members of each house of Congress, the secretaries of HEW and DoD, the administrator of the Veterans Administration, and the director of the CIA. These additions would be non-voting members who would constitute a special committee for advising the other members on classified matters.

## A Note to Readers:

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